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Forest Insect and Disease Conditions in Alaska — 1980

Forest Insect and Disease in Alaska in 1980. U.S. Department of Agriculture, Forest Service, Alaska Region, Division of State and Private Forestry (2221 E. Northern Lights Blvd., Suite 107, Anchorage, Alaska 99504) Region report number 146, August 1981.

Please report or submit samples of forest or urban tree insects or diseases to your local ALASKA STATE FORESTRY OFFICE or to one of the following addresses:

USDA FOREST SERVICE
Forest Pest Management
State and Private Forestry
2221 E. Northern Lights Blvd.
Suit 107
Anchorage, Alaska 99504
(Telephone 907-276-0939)

USDA FOREST SERVICE
Forest Pest Management
P.O. Box 1628
Juneau, Alaska 99802
(Telephone 907-586-7302)

COVER: Spruce beetle infestation near Barabara Lake on the Kenai National Moose Range.

Forest Insect and Disease Conditions in Alaska in 1980

Contents

	Page
Conditions in Brief	3
Status of Insects	3
Spruce Beetle	3
Eastern Larch Beetle	5
Engravers	6
Leaf Beetles	6
Willow Leaf Miner	6
Spruce Budworm	6
Large Aspen Tortrix	7
Leaf Rollers	7
Blotch Miner	10
Western Black-Headed Budworm	10
Birch Aphids	11
Hemlock Sawfly	11
Saddleback Looper	11
Other Loopers	12
Status of Diseases	12
Spruce Needle Rust	12
Cedar Mortality	13
Hemlock Dwarf Mistletoe	13
Sirococcus Shoot Blight	14
Spruce Stem Canker	14
Integrated Pest Management Conference	14
1980 Forest Insect and Disease Infestations in Alaska by Ownership and Pest	16
Submitting Insects and Diseases for Indentification	17
General Distribution of Specific Forest Insects and Diseases of Alaska, 1980.	8

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Forest Insect and Disease Conditions in Alaska — 1980

Conditions in Brief

Bark beetle activity continued to cause the most insect damage to forested areas in Alaska during 1980. Infestations covered 140,000 hectares[1] of white and Sitka spruce, about equal to the area infested in 1979. White spruce mortality is occurring on 13,031 hectares of the Chugach National Forest; a 3 percent increase over 1979 levels. Likewise, about 400 hectares of Sitka spruce were infested on the Tongass National Forest. Engraver infestations decreased over 1979 levels in interior Alaska; only 712 hectares were detected in 1980. Eastern larch beetle infestations increased slightly over 1979 levels; 6,472 hectares were infested in 1980.

Large aspen tortrix infestations have declined after two years of increase. Near Willow and Pt. McKenzie, 4,703 hectares of defoliated aspen were abserved. In 1979, 1,135 hectares of defoliated white spruce were observed northwest of Dillingham. The defoliator was believed to be a species of *Argyrotaenia. Final species determination showed the defoliator to be Acleris gloverana* (Walsingham). Spruce budworm (*Choristoneura* spp.) populations declined in the Anchorage area. Birch leaf roller populations dramatically increased northwest of Dillingham.

[1]One hectare = 2.471 acres

The 1980 aerial surveys detected more than 50,000 hectares of defoliated birch.

Throughout southeast Alaska, the western black-headed budworm and hemlock sawfly continued to remain at endemic levels, producing no visible defoliation. Populations of other, more localized defoliators were also low during 1980.

Cedar dieback, hemlock dwarf mistletoe, and sirococcus shoot blight continue to be the major tree diseases in southeast Alaska.

Status of Insects

Spruce Beetle, *Dendroctonus rufipennis* (Kby.)

Alaska spruce beetle populations were similar to those in 1979; infestations covered about 140,000 hectares (Fig. 1). White spruce mortality is occurring on 13,031 hectares of the Chugach National Forest; an increase of 439 hectares (3-percent) over the area infested in 1979. For the third consecutive year, the Summit Lake infestation has increased. Our 1980 aerial surveys detected 5,482 hectares of infested white spruce, an increase of 52-percent over 1979 levels.

The Resurrection Creek infestation on the Kenai Peninsula has not expanded from the 1979 level of about 6,000 hectares (Fig. 2). The number of spruce beetle killed trees and new attacks are still increasing even after five years of activity. To date, 7,093 board feet per acre of commercial white spruce has been killed by the beetle in five years. This

represents almost 60-percent of the commercial white spruce in this area.

Elsewere on the Kenai Peninsula, spruce beetle activity dramatically increased. About 18,303 hectares of infested white spruce were aerially detected on the Kenai National Moose Range. The Barabara Lake infestation is still increasing and now encompasses close to 4,788 hectares. About 7,755 hectares of scattered infested spruce were detected due west of Tustumena Lake. Near Homer, at the southern end of the Kenai Peninsula, the infestations detected in 1979 have not increased. They are scattered, encompassing 1,666 hectares.

On the west side of Cook Inlet, infestations cover about 147,422 hectares; comparable to 1979 infestations. The 1979 infested areas north of Tuxedni Bay have decreased in 1980. Similar to last year, the areas of heaviest infestation occur north of lower Beluga Lake and are continuing to expand in a northeast direction.

Salvage operations are continuing on the infested State lands near Tyonek. As of October 1980, 67.6 MMBF of white spruce was harvested on the Westside Salvage Timber Sale. About 80 percent of this volume was beetle killed. Hardwood volume cut was 22.8 MMBF of birch and 15.9 MMBF of cottonwood.

Throughout interior Alaska, spruce beetle activity was detected on only 977 hectares, a decrease of 581 hectares over 1979 levels.

For the first time in many years, the spruce beetle has reached

Fig. 1 — Spruce beetle infestation, Resurrection Creek.

outbreak levels in southeast Alaska. About 400 hectares of infested Sitka spruce were detected along the Taku River near Juneau. The beetle infestation appears to be about three years old, probably having originated in windthrown timber near Kluchman Mountain. Present damage is heaviest in the area between Twin Glacier Lake and the U.S. - Canada border. Although tree mortality is most extensive on the north side of Taku River, some small patches are evident on the south side as well. This outbreak is of particular interest, since high beetle populations are much less common in Sitka spruce than in white spruce.

A blowdown near Salmon Bay Lake (N. Prince of Wales Island) was examined for possible spruce beetle buildup. Populations appear to be low in the windthrown spruce, and we see no immediate threat to standing timber.

1980 spruce beetle infestations by ownership are as follows: National Forest — 13,472 hectares; State, private and Cook Inlet Region, Inc. holdings or selections — 101,584 hectares; other Federal Lands (*e.g.* Kenai National Moose Range, National Monuments) — 21,710 hectares.

Eastern Larch Beetle, *Dendroctonus simplex* (LeC.)

Eastern larch beetle infestations

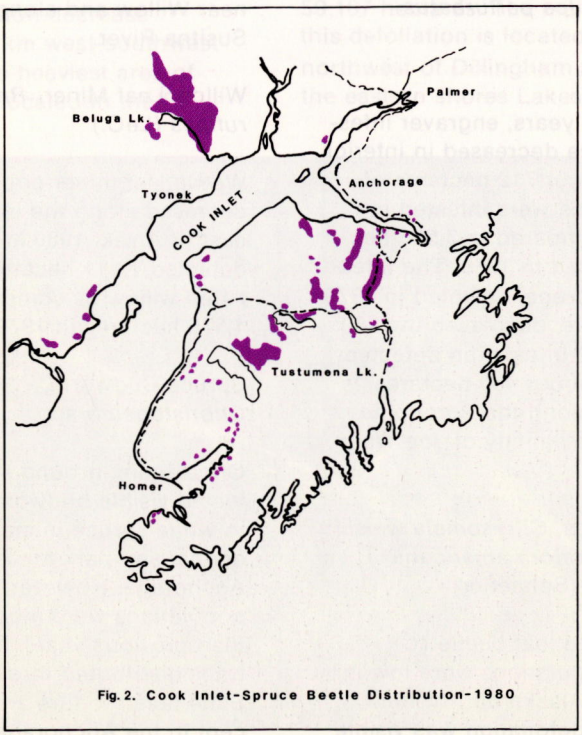

Fig. 2. Cook Inlet-Spruce Beetle Distribution-1980

Fig. 2 — Spruce beetle, Cook Inlet Area, 1980 aerial detection survey.

have increased slightly in the interior from 6,462 hectares in 1979 to 8,005 hectares in 1980. The largest concentration of larch beetle activity (1,827 ha.) is scattered along the Susulatna River, northwest of Medfra (Kuskokwim River). Another 1,723 hectares of larch beetle infestations occur along the Yukon River, west of Galena near Fish Island.

Larch beetle populations are still declining in the area in and around the Mount McKinley National Park. It appears that most of the susceptible tamarack has been infested in the last four to five years and larch beetle activity has essentially run its course.

Engravers, *Ips perturbatus* (Eichh.)

After three years, engraver infestations have decreased in interior Alaska. About 712 hectares of white spruce were infested in 1980 as compared to 3,525 hectares infested in 1979. The infestation in spruce, detected in 1979 near Venetie, decreased in 1980. The largest infestation detected this year, about 450 hectares, is scattered along the Porcupine River in the vicinity of Joe Ward Camp.

Leaf Beetles, *Chrysomela walshi* Brown, *Phratora americana americana* (Schaeffer)

Cottonwood leaf beetle (*C. walshi*) populations were low in southeast Alaska during 1980. Very light defoliation was visible on cottonwoods in the upper Lynn Canal area, Taku River, and the Mendenhall Glacier Valley near Juneau.

The leaf beetle in southeast Alaska was previously thought to be *Chrysomela scripta* F., but has now been identified as *C. walshi* Brown (Fig. 3). Observations made in the Mendenhall Valley indicate that the leaf beetle completes only one generation per year, overwintering in the adult stage. The beetles appear on cottonwood and willow leaves in mid-May and begin feeding shortly thereafter.

In south-central Alaska, leaf beetles (*P. americana*) defoliated about 5,274 hectares of balsam poplar along the Parks Highway near Willow and along the Susitna River.

Willow Leaf Miner, *Rhynchaenus rufipes* (LeC.)

Weevil leaf miner populations decresed along the Innoko River, east of Anvik. 1980 aerial surveys detected 1,111 hectares of defoliated willow as compared to 1,576 hectares in 1979.

Spruce Budworm, *Choristoneura* spp.

Once again, ground surveys detected visible budworm damage to white spruce in many residential and park areas of Anchorage. However, budworm populations were much lower than previous years. Pheromone traps distributed throughout the State failed to lure any adults except in the Anchorage area.

Spruce budworm life history studies were continued throughout 1980 in cooperation with Canada. Preliminary results now indicate that only one budworm species is involved. Most of the evidence now indicates the Alaska budworm most closely resembles those from Kitimat British Columbia, identified as *C. orae* Free. Efforts will be continued to delineate the budworm species and the impact of this defoliator.

Large Aspen Tortrix, *Choristoneura conflictana* (Wlkr.)

1980 aerial surveys detected heavy tortrix defoliation of quaking aspen on 4,703 hectares; a decrease of 6,131 hectares over the area defoliation in 1979. Most of the population decrease occurred five km west-southwest of Willow. The heaviest area of defoliation is located in the Pt. McKenzie area, north of Anchorage, across Knik Arm. Surveys near Pt. McKenzie in the Spring and Fall of 1980 indicated that only 12 percent of the aspen were top killed and 16 percent showed some signs of branch dieback as a result of three consecutive years of 90 percent-plus defoliation. Tortrix populations are slowly increasing in both the Anchorage Bowl and interior aspen forests.

Leaf Rollers, *Epinotia solandriana* L.

After two to three years of endemic levels, leaf rollers dramatically increased in numbers in 1980 (Fig. 4,5). Aerial surveys detected heavy birch leaf roller activity on approximately 59,167 hectares. The majority of this defoliation is located 50 km. northwest of Dillingham along the eastern shores Lakes Alek-

Fig. 3 — Adult *Chrysomela walshi.*

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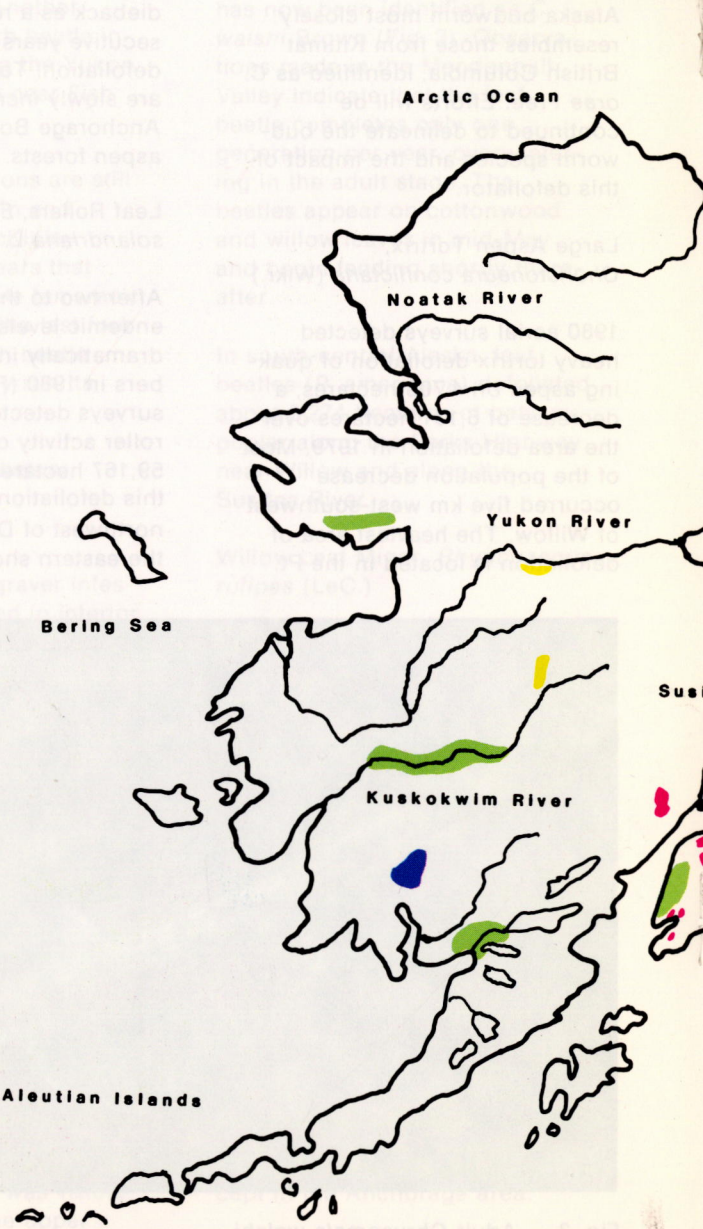

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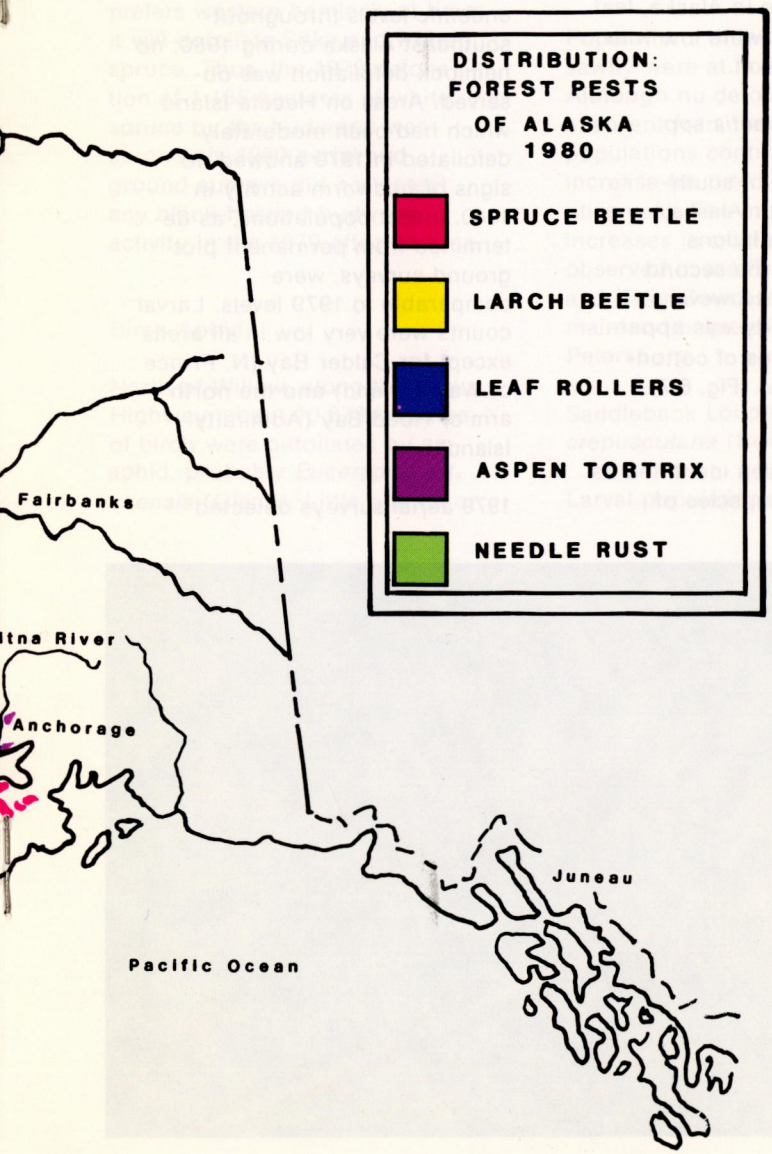

nagik, Nerka, Beverly and Kulik. Affected birch were 90 percent-plus defoliated. Near Juneau, homeowners reported leaf roller damage on various ornamentals including alder, birch, cherry, cottonwood and willow. The leaf roller in southeast Alaska is also believed to be *Epinotia solandriana* L. Elsewhere in Alaska, leaf roller populations were low with no visible defoliation.

Blotch Miner, *Lyonetia* spp.

Throughout most of south-central and interior Alaska, blotch miner populations remained low for the second consecutive year. However, heavy miner activity was apparent on 504 hectares of cottonwood near Seward (Fig. 6,7).

This miner has been identified as an undetermined species of *Lyonetia.* This is a new record in Alaska.

Western Black-Headed Budworm, *Acleris gloverana* (Walsingham)

Black-headed budworm populations continued to remain at endemic levels throughout southeast Alaska during 1980; no hemlock defoliation was observed. Areas on Heceta Island which had been moderately defoliated in 1979 showed no signs of budworm activity in 1980. Insect populations, as determined from permanent plot ground surveys, were comparable to 1979 levels. Larval counts were very low in all areas except for Calder Bay (N. Prince of Wales Island) and the north arm of Hood Bay (Admiralty Island).

1979 aerial surveys detected

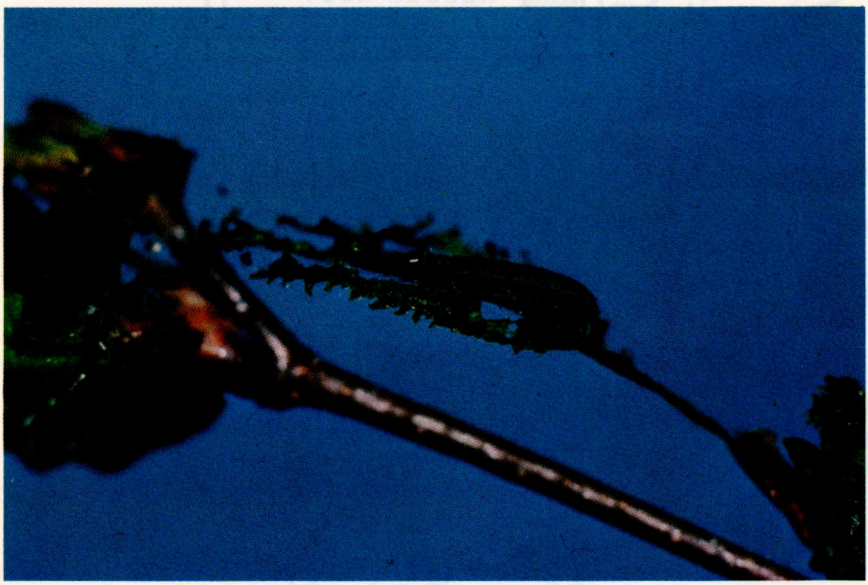

Fig. 4 — Leaf roller larva

1,135 hectares of heavy white spruce defoliation northwest of Dillingham. This damage was tentatively attributed to an undetermined species of *Argyrotaenia.* However, later study of adults revealed the correct identity of the insect: *A. gloverana* (Fig. 8). The black-headed budworm prefers western hemlock; at times it will defoliate Sitka and white spruce. Thus, the 1979 defoliation of 1,135 hectares of white spruce by the budworm was surprising. 1980 aerial and ground surveys did not detect any black-headed budworm activity in the 1979 affected area.

Birch Aphids

North of Willow, along the Parks Highway, about 10,679 hectares of birch were defoliated by an aphid, probably *Euceraphis sitchensis* (Glenn). Little branch or top dieback should occur as a result of the defoliation as most of the damage took place only a few weeks before fall leaf drop. The affected birch had already passed their peak growth period.

Hemlock Sawfly, *Neodiprion tsugae* (Midd.)

Populations of the hemlock sawfly were at low levels in 1980. Although no defoliation was apparent from the air, larval populations continued to increase for the the third consecutive year. The most substantial increases in sawfly larvae were observed in the Bradfield Canal and Saks Cove areas on the mainland between Ketchikan and Petersburg.

Saddleback Looper, *Ectropis crepuscularia* (Denis & Schiff)

Larval populations of the

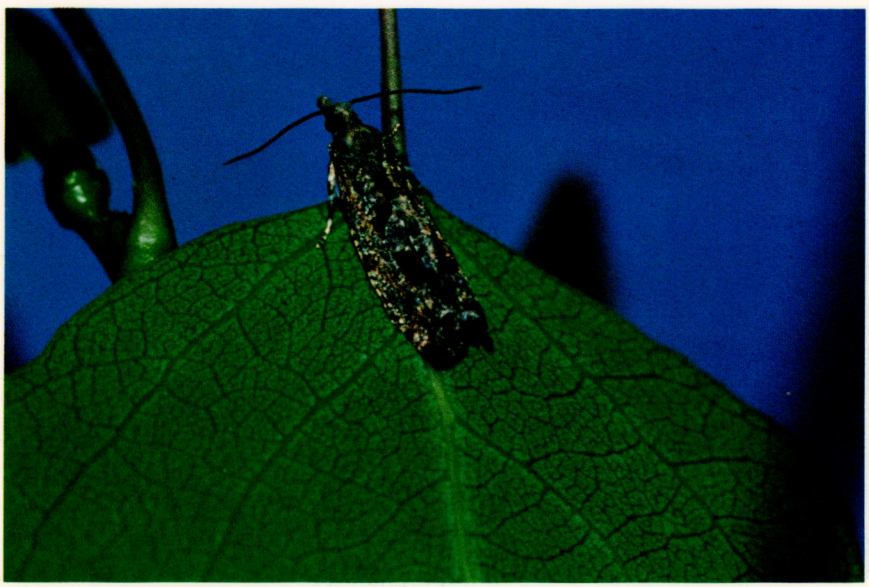

Fig. 5 — Adult leaf roller.

saddleback looper dropped substantially from 1979 levels, and caused no visible defoliation during 1980.

Other Loopers (Geometridae)

Populations of three other hemlock defoliators increased during 1980, although all three species remained endemic in southeast Alaska. The green-striped forest looper (*Melanolophia imitata* (Walker)) increased considerably, both in number of plots with larvae, and total larvae collected. Population levels of the Columbia brindle looper (*Anthelia hyperborea* Hlst.) and *Hydriomena irata* Swett. also increased during 1980, and were widely distributed.

Status of Diseases

Spruce Needle Rust, *Chrysomyxa ledicola* Lagerh.

The incidence of spruce needle rust increased dramatically over 1979 levels (Fig. 9). Approximately 40,000 hectares of infected white spruce were mapped in 1980. Due to travel constraints, many areas of infected spruce were not mapped. It is felt that at least 100,000 hectares of spruce were infected in 1980.

The needle rust infected close to 35,000 hectares of spruce on the Kenai Peninsula vs. 16,351 hectares in 1979. Up to 90 percent of the current year's needles on all age classes of white spruce were infected.

The largest area of infection extends from north of Clam Gulch to south of Anchor Point. The needle rust was prevalent throughout: southwest Alaska (Dillingham, King Salmon, Lake

Fig. 6 — Blotch miner defoliation, Seward, Alaska.

Clark); the Seward Peninsula; and along the Kuskokwim River between Bethel and Stony River.

Three consecutive wet summers have undoubtedly contributed to the increase in needle rust activity. High relative humidity in spring and early summer favors large spore release from the rust's alternate host, Labrador tea. In late July, the rust sporulates on spruce. It is at this time that the spruce take on the characteristic orange color of infected trees.

Cedar Mortality

A total of 7,748 hectares of cedar mortality was delineated in southeast Alaska. A little over 6,489 hectares of this total was found north of Sumner Strait and involved Alaska yellow-cedar only. The mortality south of Sumner Strait was in mixed Alaska yellow-cedar and western redcedar. Slocum Arm and the Peril Strait-Sergus Narrows areas were the most severly affected. Circular areas of mortality in the vicinity of Sergus Narrows were reminiscent of root disease centers in other stands. *Armillaria mellea* (Vahl.) Quel. was found on some of the dying yellow-cedar in Slocum Arm. Galleries made by *Ploeosinus* bark beetles were found on some of the old yellow-cedar mortality in the same area. No current cedar bark beetle activity was noted.

Hemlock Dwarf Mistletoe, *Arceuthobium tsugense* (Rosend.) G.N. Jones

Hemlock dwarf mistletoe continues as the major cause of volume loss in western hemlock stands. This parasite occurs in southeast Alaskan forests from

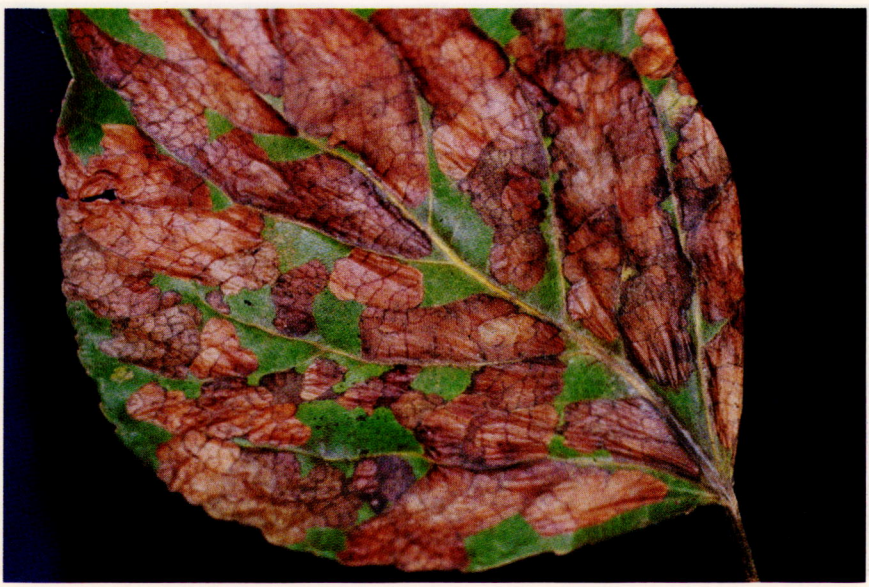

Fig. 7 — Mined cottonwood leaf.

Portland Canal in the south to Haines in the north, and from sea level to about 1,000 feet in elevation.

Sirococcus Shoot Blight, *Sirococcus strobilinus* (Desm.) Petr.

Sirococcus shoot blight, caused by *Sirococcus strobilinus* (Desm.) Petr. was found attacking mountain hemlock, *Tsuga mertensiana* (Bong.) Carr., at Hasselborg Lake on Admiralty Island. This is the second reporting of this fungus on mountain hemlock in southeast Alaska. The fungus has been found throughout southeast Alaska on western hemlock.

Spruce Stem Canker

An eight hectare patch of 15- to 18-year-old Sitka spruce with numerous stem cankers was found on Kosciusko Island. The causal agent has not been identified.

Integrated Pest Management

An integrated pest management (IPM) conference, sponsored by USDA Forest Service, State and Private Forestry, and Cooperative Extension Service, was held in Anchorage on October 20-21, 1980, at the University of Alaska campus. The conference addressed IPM questions in three major areas; agriculture,

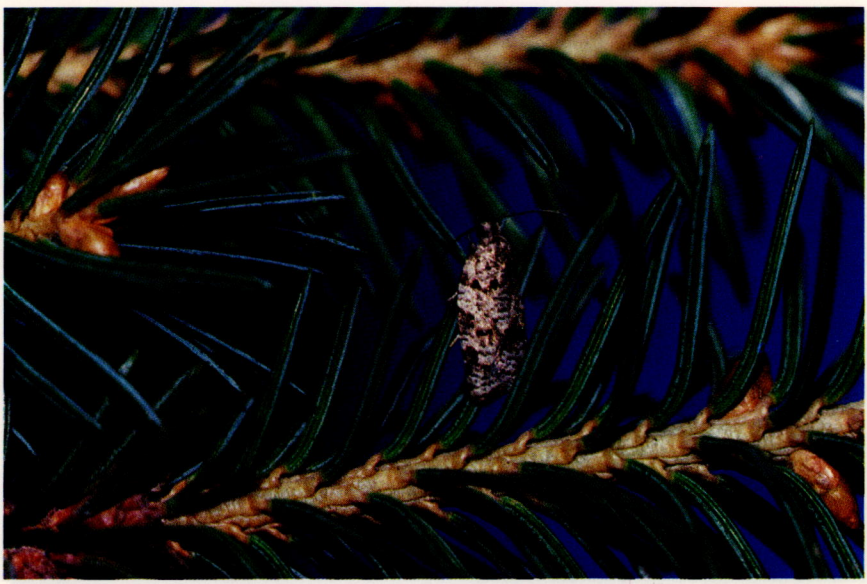

Fig. 8 — Adult black-headed budworm.

horticulture, and forestry. Audience and speakers included individuals from Universities, State and private agricultural and forestry research, land management agencies, gardeners, and pesticide applicators.

The 1979 Environmental message to Congress described IPM as "a systems approach to reduce pest damage to tolerable levels through a variety of techniques, including predators and parasites, genetically resistent hosts, natural environmental modifications, and when necessary and appropriate, chemical pesticides."

Few pesticides or other control measures have been used in Alaska to suppress pest outbreaks. Due to economic considerations or other "feelings", we apparently prefer to take the losses caused by forest pests. In the present situation of rapidly changing land ownership and management objectives, this "do-nothing" situation may be detrimental to the long-term management of many sites. As we move from an abundance of wood resources to one of increasing scarcity we will be forced to make decisions involving the use of pesticides on a regular basis as part of the integrated pest management decision making system.

Alaska's first IPM conference was successfull in its aim of information dessimination and interagency cooperation and future directions in IPM programming. In Alaska, as well as the rest of the U.S., we must shift to preventive management using an IPM systems approach instead of a "reaction" approach, which has been all to common in the past.

Fig. 9 — White spruce infected with spruce needle rust.

1980 Forest Insect and Disease Infestations in Alaska by Ownership and Pest in Hectares

Pest	National Forest	Other Federal	Native	State & Private
SPRUCE BEETLE *Dendroctonus rufipennis*	13,472	21,710	73	101,511
EASTERN LARCH BEETLE *Dendroctonus simplex*	—	344	1,097	6,563
ENGRAVERS *Ips* spp.	—	541	151	20
LEAF BEETLES *Phratora americana americana* *Chrysomela walshi*	20	—	202	5,072
WILLOW LEAF MINER *Rhynchaenus rufipes*	—	—	1,111	—
SPRUCE BUDWORM *Choristoneura* spp.	—	—	—	20
LARGE ASPEN TORTRIX *Choristoneura conflictana*	—	—	26	4,677
LEAF ROLLERS *Epinotia solandriana*	—	—	5,472	53,695
BLOTCH MINER *Lyonetia* spp.	504	—	—	—
BIRCH APHIDS	—	—	—	10,679
SPRUCE NEEDLE RUST *Chrysomyxa ledicola*	121	20,000	5,000	15,000
CEDAR DIEBACK	7,748	—	—	—
SPRUCE STEM CANKER	8	—	—	—

TOTAL-INSECT: 226,960 hectares
TOTAL-DISEASE: 47,877 hectares
STATE TOTAL (Insect and Disease): 274,837 hectares

Submitting Insects and Diseases for Identification

People interested in obtaining positive identification of insect and disease specimens should submit samples to specialists. The following procedures for the collection and shipment of specimens should be used:

Specimen Collection:

1. Adequate material should be collected.
2. Adequate information: the value of an insect or disease specimen depends on the information regarding its collection.
   a. Where the specimen was collected: nearest Post Office or town, elevation, aspect, and so forth.
   b. When the specimen was collected.
   c. Who collected the specimen.
   d. Host description (age, species, and general appearance).
   e. General condition of the surrounding area (fire, blowdown, logging, and so forth).
3. Personal Opinion of the problem is very helpful.

Shipment of Specimens:

1. General:
   a. Pack specimens in such a manner that breakage will be minimal.
2. Insects: Specimens sent through the mail should be packed to withstand rough treatment.
   a. Larvae and other soft-bodied insects should be shipped in small screw-top vials or bottles containing at least 70 percent isopropyl (rubbing) alcohol. Make certain the bottles are sealed well. Include in each vial adequate information, or a code, relating the sample to the written description and information. Labels inserted in the vial should be written on with pencil or India ink. Do not use a ballpoint pen, as the ink is not permanent.
   b. Pupae and hard bodied insects may be shipped either in alcohol or in small boxes. Specimens should be placed between layers tissue paper in the shipping boxes. Pack carefully and make certain that there is very little movement of material within the box. Do not pack insects in cotton.
   c. Adult moths, butterflies and fragile insects should be carefully placed between layers of tissue paper before packing.
3. Needle Diseases:
   a. Do not ship in plastic bags. Sprinkle lightly with water before wrapping in newspaper.

Shipping:

1. Ship as quickly as possible. If samples cannot be shipped rapidly, store them in a refrigerator.
2. Include address inside shipping carton.
3. Mark: "FRAGILE: INSECT-DISEASE SPECIMENS ENCLOSED: FOR SCIENTIFIC PURPOSES ONLY: NO COMMERCIAL VALUE".

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